Oki sampling GaN HEMT

Oki Electric Industry Co Ltd has started provisional sampling of GaN-HEMT, high frequency wave power transistor for wireless base stations, using GaN material. With this transistor, base stations for 3G mobile phones, PHS, and wireless telecom base stations for wireless Metropolitan Area Network can reduce its size and power consumption.

Because GaN-HEMT has a high output power density (output power by gate width) of 3-10 W/mm, ten-fold higher than conventional GaAs-HEMT, transistor size is reduced. Traditionally, electric power was combined with multiple transistors to receive high output. With GaN-HEMT, a smaller size can be achieved because output power per transistor is large, reducing transistor numbers, transmission circuit components and peripheral circuits.

"As smaller size and lower power consumption base stations have been longed for, I believe Oki's Gan-HEMT will impact the GaN high frequency power device market," said Harushige Sugimoto, CTO at Oki Electric. "We will work on reducing the size, lowering the cost and achieving higher output by bringing in customer needs and work on commercialising products for 3G mobile phone base stations and wireless MAN products."

As mobile phone services get more sophisticated and varied, data communication increases, which results in the need for a higher output power. To secure a high output power, it is necessary to enlarge power transistors and, as the number of base stations increase, it has been a challenge to expand base station size and ensure higher power consumption.

To avoid power loss in high-frequency cables, most base stations are starting to use tower-top configurations, placing a high frequency amplifier near the antenna. Because of this, it is necessary to make the amplifier chassis small.

In order to reduce the loss of direct current from power cables, higher power voltage is necessary. In particular, the power transistor in the transmitter is required to be smaller and higher voltage as it holds a large portion in package size and power consumption of the amplifier box.

GaN-HEMT can operate at over 3-5x higher voltage than that of GaAs-HEMT, which enables higher voltage power. The power loss in peripheral component (ohm loss) is reduced, because the operating current can be decreased by 1/3 to 1/5, contributing to lowering power consumption of the entire circuit. With these advantages, a product for high output wireless and wireless base stations using GaN-HEMT are in high demand.

By operating at high output power density of 7.8W/mm, in this sample Oki was able to achieve a high output saturation power of 50.2W and a significant reduction in size, 1/9 of the products from other companies in volume ratio.

The Adjacent Channel leakage Power Ratio (a power transistor performance indicator,) achieves a low of 55dBC (when back-off of 10dB in saturation power and 5MHz in W-CDMA signal input), which is a tenth the specification for the signal amplifier for 3G mobile phone base stations.

Oki plans sample shipment from early 2006, after prior evaluations with specific customers, and volume production from the latter half of 2006.

By 2008, Oki aims to achiever 30% of the world GaN high-frequency power device markets.

Sirenza self-bias amplifiers

Sirenza Microdevices has a new family of high performance broadband amplifiers for wireless & CATV infrastructure applications. The InGaP HBT Darlington amplifiers are designed to run off of a fixed 5V supply and provide improved temperature stability. The first two amplifiers in this family are SBB-1089 and SBB-2089.
These have an output IP3 of +43dBm at 240MHz with a bandwidth of 50-850MHz. The SBB-1089 has 15.5dB gain and 19dBm P1dB, while the SBB-2089 has 20dB gain and 20dBm P1dB consuming only 90mA supply current. Both amplifiers use Sirenza's Thermal Distribution System to lower junction temperatures and increase reliability. The family features Class 1C (1000V HBM ESD) and MSL-1 package rating.

John Pelose, VP and GM for the amplifier division says, "These Darlington amplifiers are the first to market featuring self-bias operation in a SOT-89 package."

SiGe MMIC amplifier

Hittite Microwave Corp has a new SiGe HBT Gain Block MMIC amplifier covering DC to 5 GHz. The high linearity HMC 482ST89 SiGe HBT Gain Block is fully matched to 50 Ohms, provides 19dB gain, and can be used as a cascadable gain stage in various RF & IF applications.

With +22 dBm of output P1dB and +36 dBm of output IP3 at 1 GHz, the HMC482ST89 can also be used as an LO buffer amplifier or PA pre-driver. This MMIC amplifier consumes only 110mA from a single positive supply of +6V, and requires no external matching components.

The HMC482ST89 is housed in an industry standard SOT89 surface mount package. Samples and evaluation PC boards are available from stock and can be ordered on line.

Xindium InGaP HBT

Xindium Technologies has introduced a new power amplifier module, the XPA 9133.

The quad-band, 7x10mm GSM/GPRS InGaP HBT device with integrated power control, features best-in-class efficiency and ruggedness.

The XPA 9133 has a pinout and a power control scheme that are similar to the current generation of 7x10mm GSM/GPRS PA modules, reducing the need for changes in circuit board design for manufacturers.

Xindium CEO John Brewer said "This power amplifier module represents an excellent addition to Xindium's industry-leading InP DHBT technology base."

The XPA 9133 supports tri-band and quad-band applications.